

Update Per- and Polyfluoroalkyl Substances (PFAS)

Regulatory Agency DRAFT 6/3/19

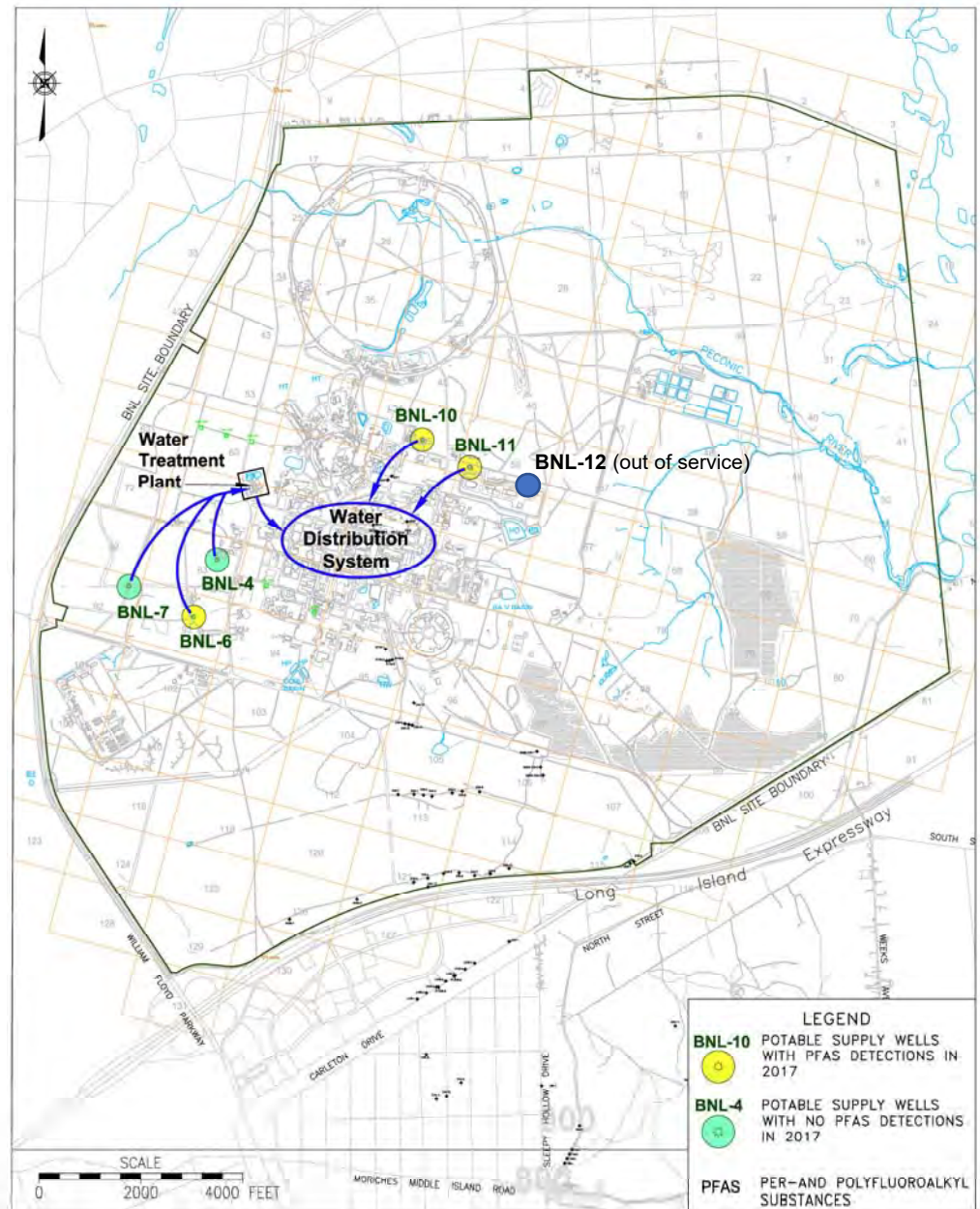
Douglas Paquette, PG
BNL Groundwater Protection Group
Community Advisory Council
June 13, 2019

BROOKHAVEN
NATIONAL LABORATORY



2017 - First Testing for PFAS in Groundwater at BNL

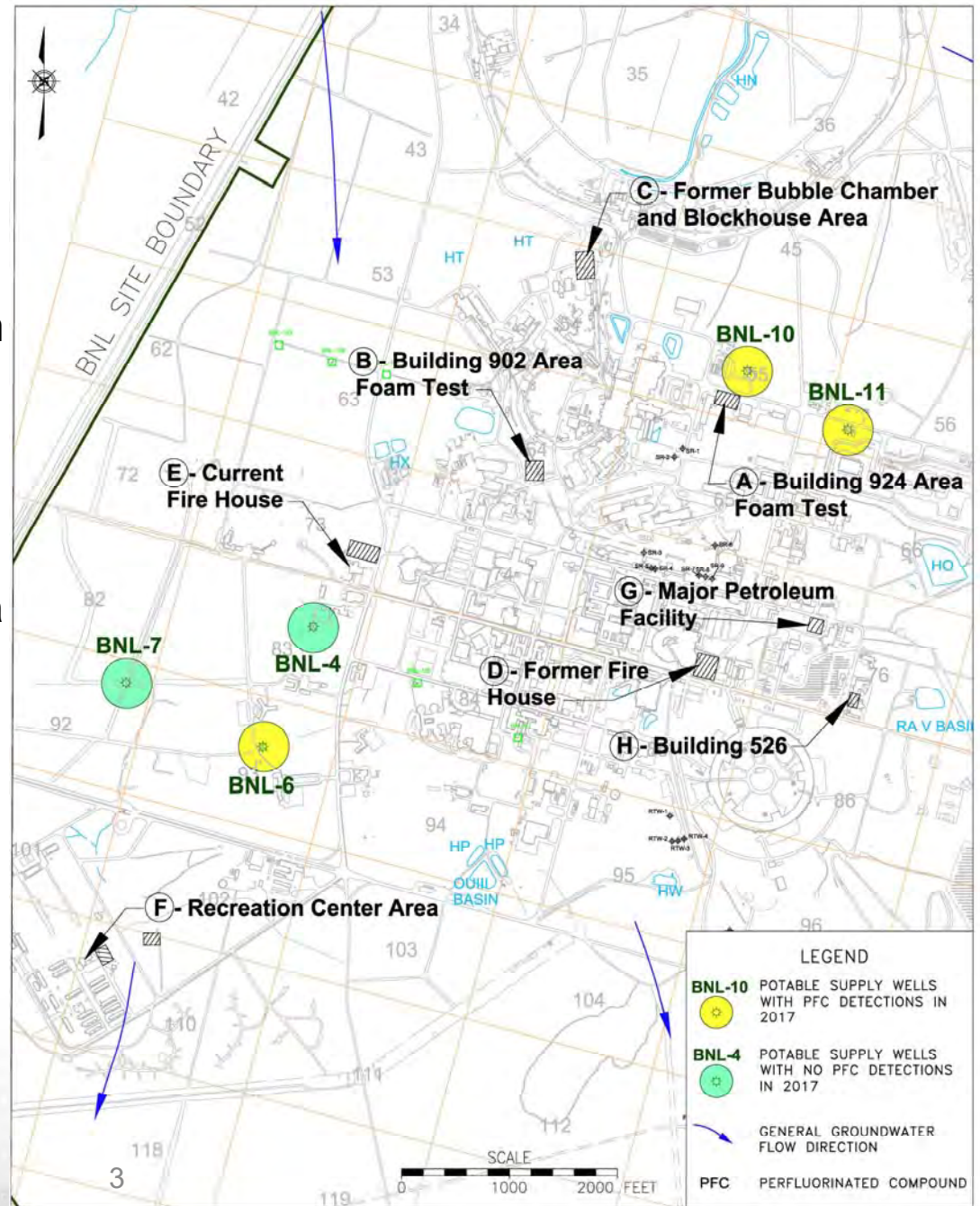
- Suffolk County tested water samples from BNL's potable water wells for PFAS
 - Tested for six PFAS compounds
 - Results were compared with the 70 ng/L Lifetime Health Advisory Level (HAL) for PFOS+PFOA
- PFAS were detected in three of BNL's five active water supply wells.
 - Confirmed by analyzing multiple samples during 2017 and 2018
 - PFOS/PFOA concentrations
 - Wells 10 and 11: up to 33 ng/L
 - Well 6: up to 70.4 ng/L
 - All other samples were <70 ng/L
 - Most recent = 2.4 ng/L
 - Use of this well is now limited
 - Water Treatment Facility <3 ng/L
- Routine testing for PFAS was added to potable water monitoring program in 2018
 - Samples are now tested quarterly
 - Results have been consistent



Source of PFAS = Firefighting Foam

Based upon review of available records and interviews with current long-term firefighters and retirees, identified eight locations where foam was stored or released:

- A. Trailer near Building 924 (1970)
- B. Area near Building 902 (1970)
- C. Former Bubble Chamber Experiment and Blockhouse Area (1973 [2 times], 1980)
- D. Former Firehouse (1966-1985)
- E. Current Firehouse (1986-2008)
- F. Recreation Center Area (1978, 1980)
- G. Major Petroleum Facility (1986)
- H. Building 526 (no documented releases)



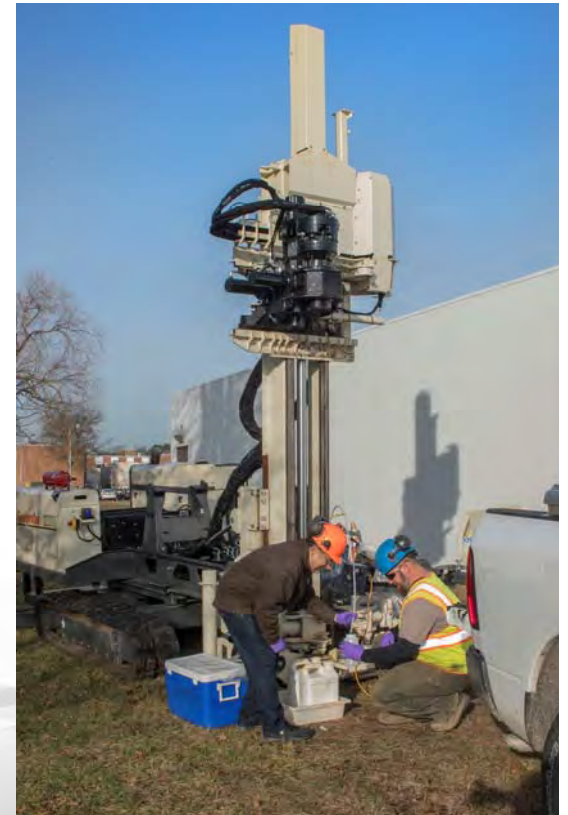
Groundwater Characterization

Phased effort to determine the impacts from PFAS:

- Phase 1- Source water contributing areas for the supply wells
- Phase 2- Eight foam release areas
- Phase 3- Groundwater treatment wells/systems, landfill areas, Sewage Treatment Plant effluent and groundwater, southern boundary monitoring wells

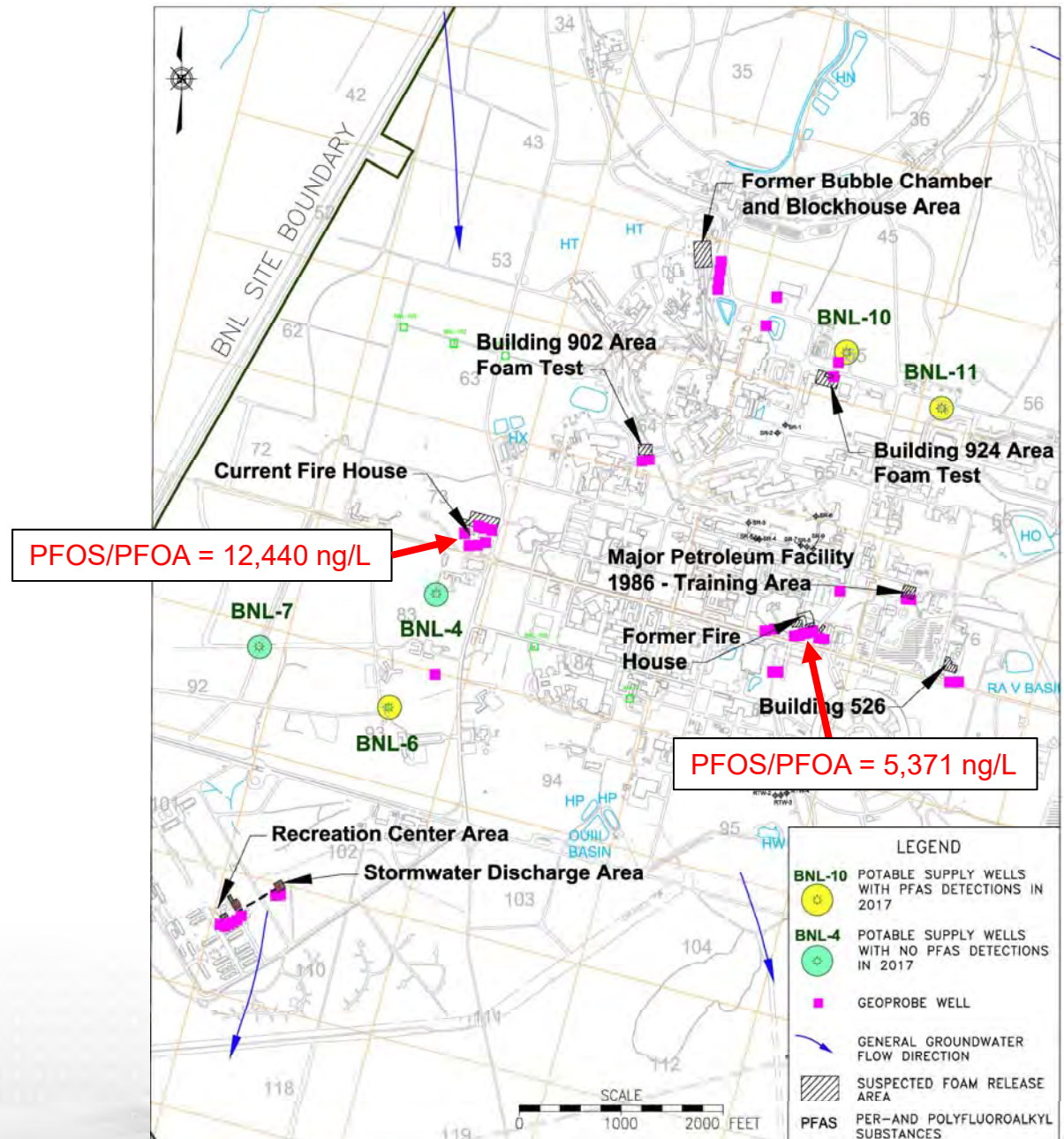
Collected approximately 500 samples:

- 53 temporary monitoring wells
- 45 permanent monitoring wells
- 43 groundwater treatment system extraction wells
- 6 groundwater treatment systems influent/effluent
- Sewage Treatment Plant (STP) effluent



PFAS Characterization – Source Areas

- Installed 42 temporary monitoring wells
 - Tested for 21 PFAS compounds
- Results: PFAS were detected in groundwater at all eight known foam use areas
- Highest PFOS/PFOA concentrations detected at:
 - Former firehouse area
 - Current firehouse
- High levels of other PFAS compounds were also detected (e.g., PFHxA, PFHxS, PFBS)

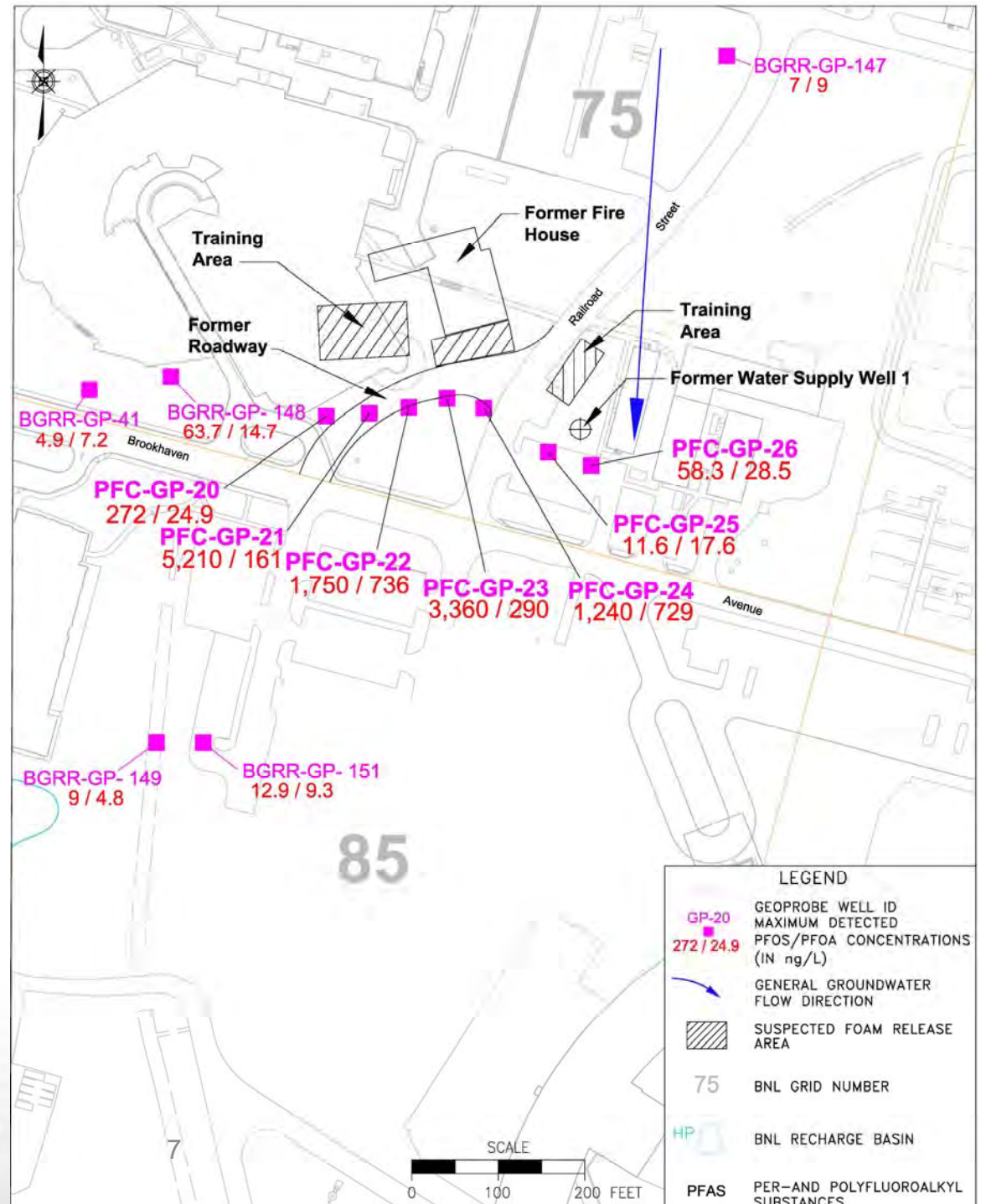


Former Firehouse Foam Release Areas (1966-1985)



Former Firehouse

Temporary Well Results

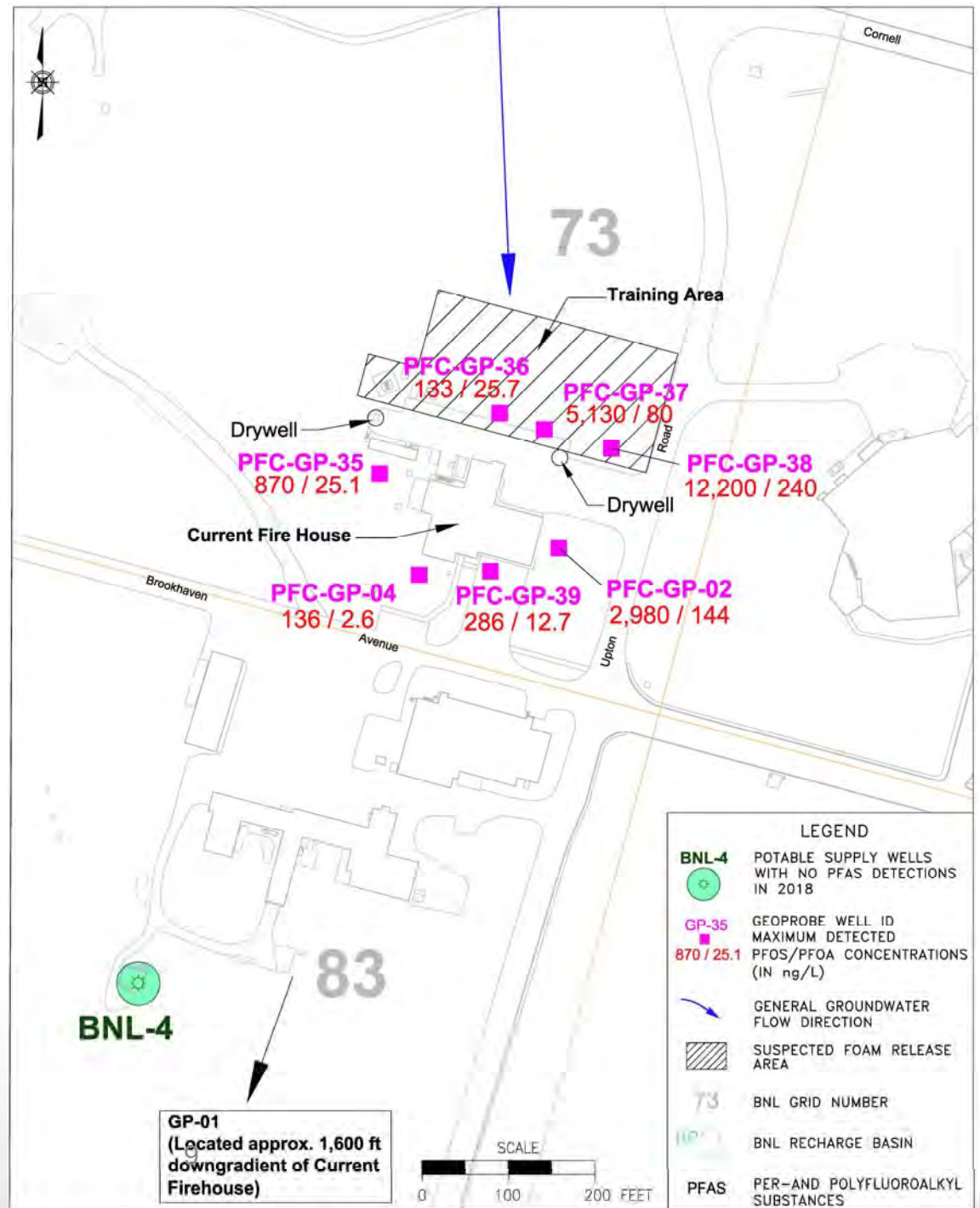


Current Firehouse Foam Release Areas



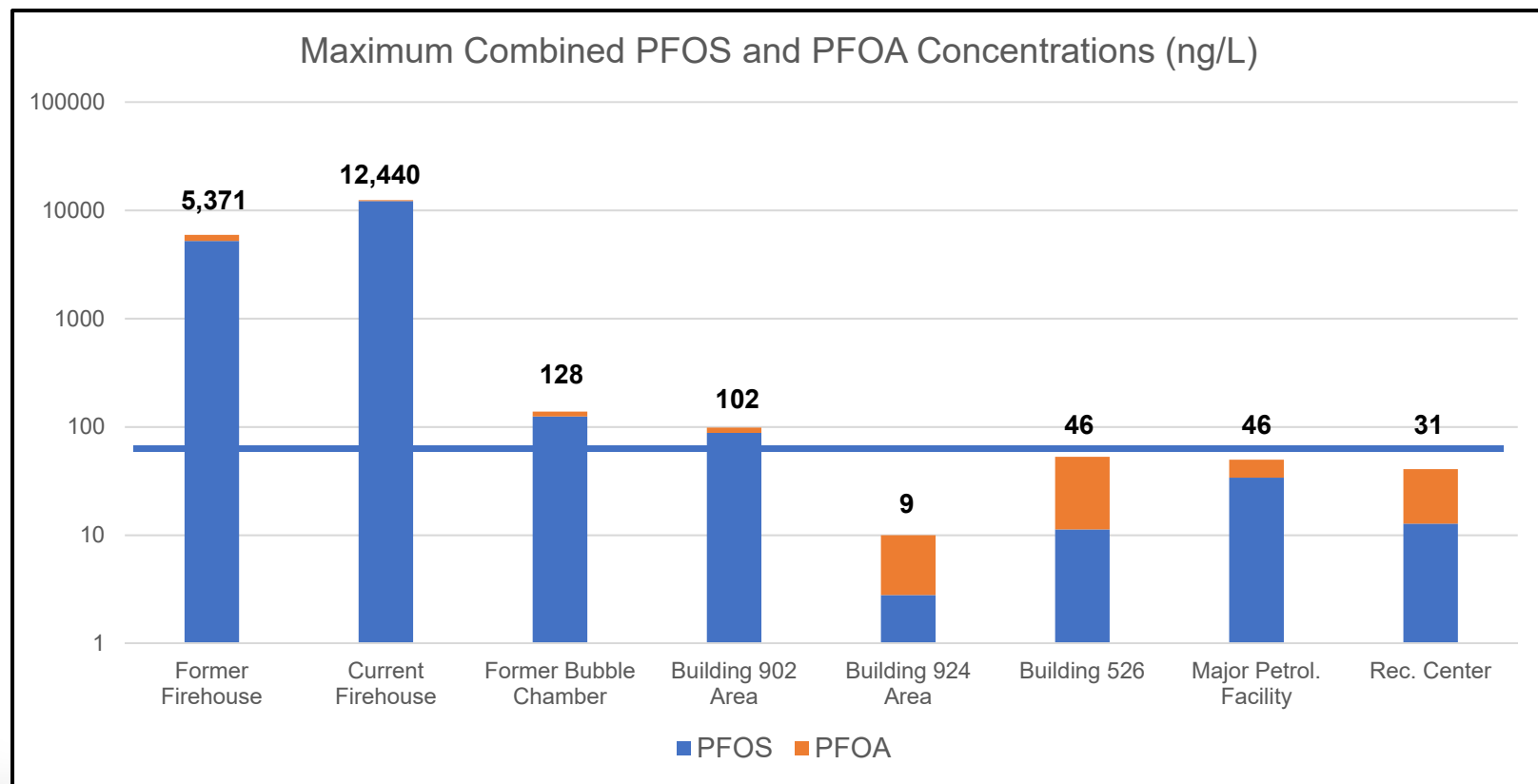
Current Firehouse

Temporary Well Results

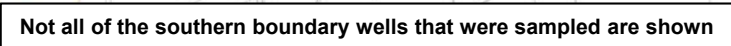


Combined PFOS and PFOA Concentrations

Compared to the current 70 ng/L HAL

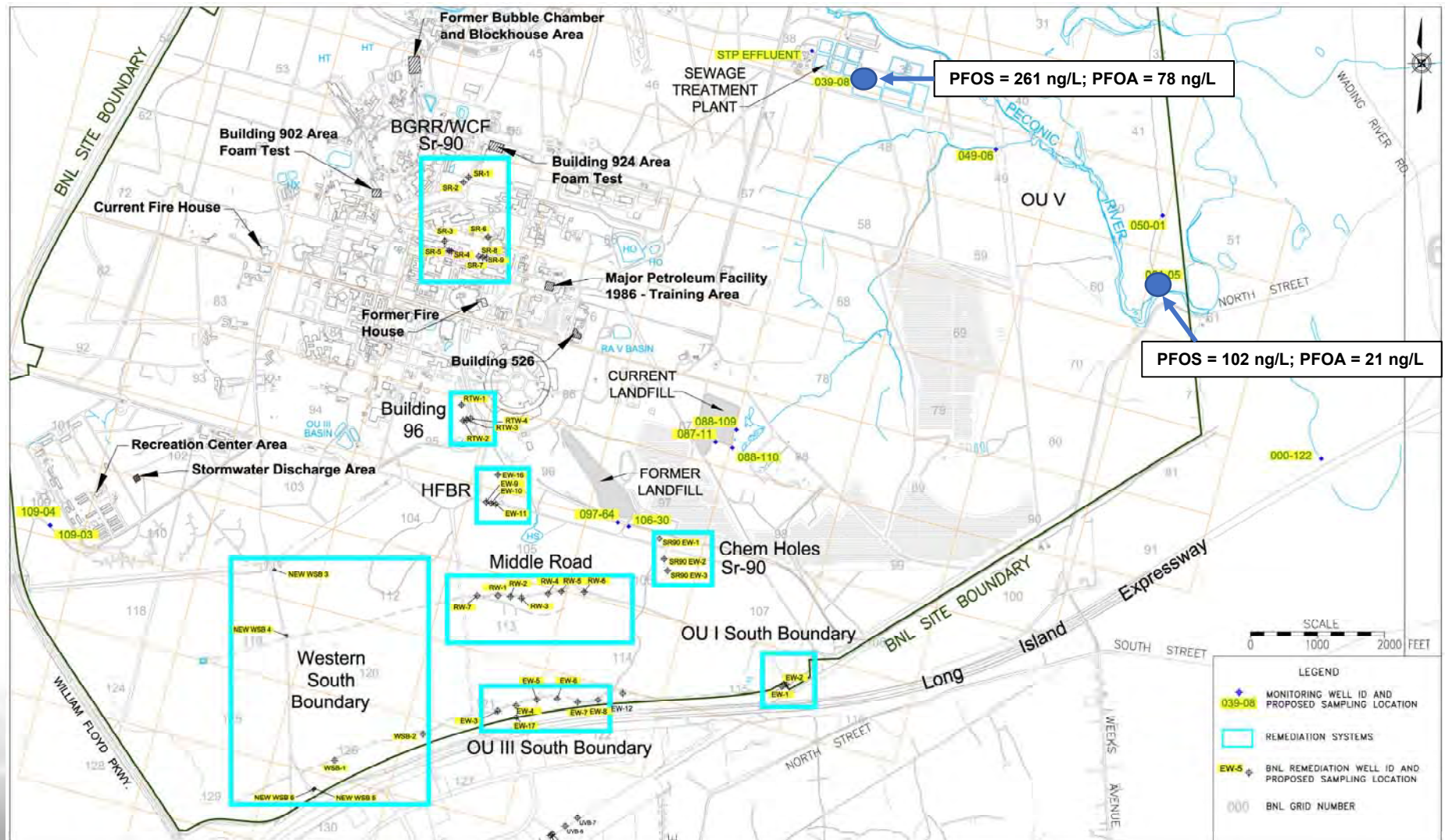


- 45 permanent wells: landfill area wells, STP/OU V wells, and wells along the southern boundary
- 11 temporary wells at site boundary



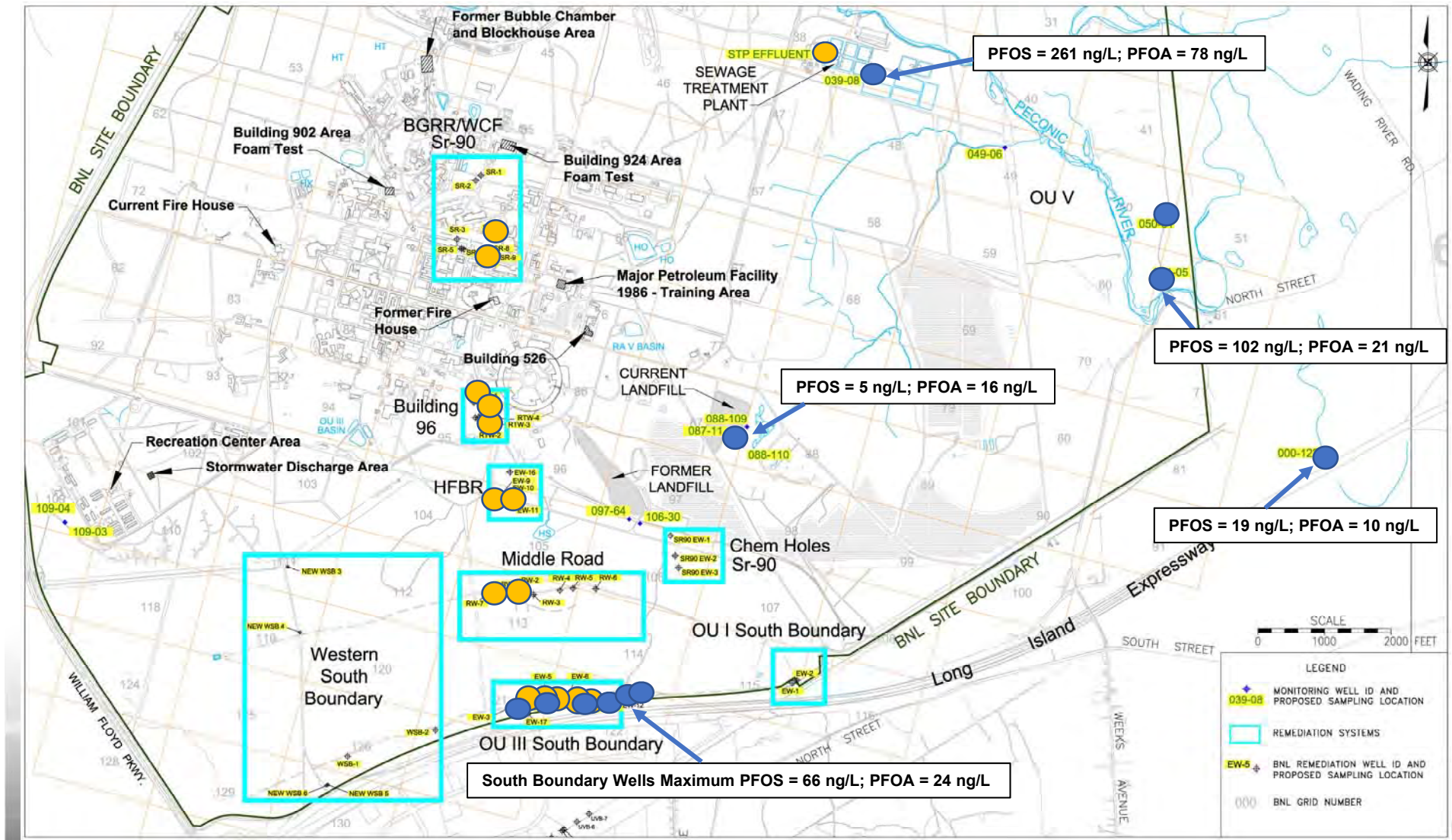
Combined PFOS and PFOA Concentrations > 70 ng/L HAL

- = PFOS + PFOA > 70 ng/L (Monitoring Well)
- = PFOS + PFOA > 70 ng/L (Extraction Well/Treatment System)



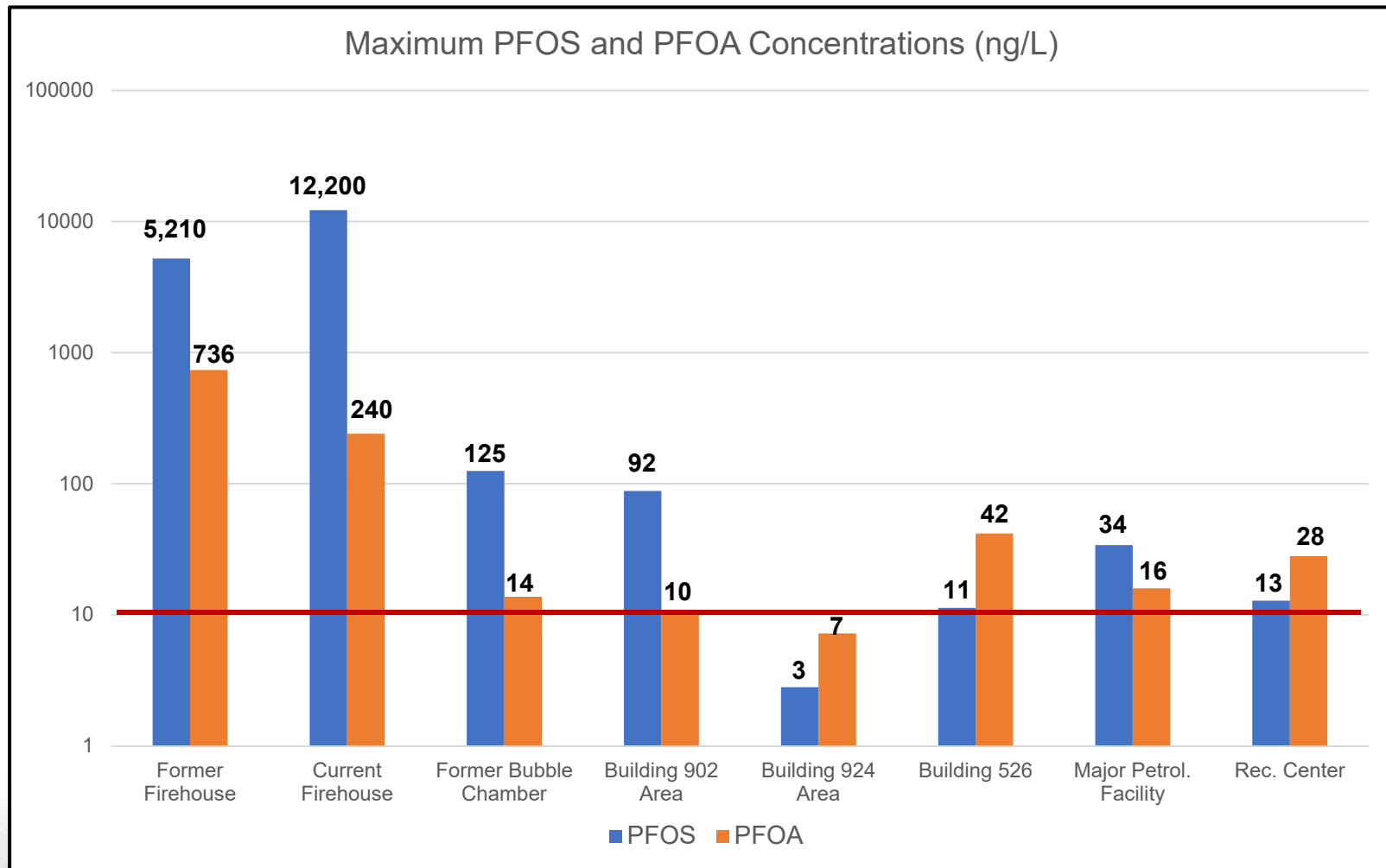
Individual PFOS and PFOA Concentrations >10 ng/L (proposed NYS standard)

- = PFOS/PFOA > 10 ng/L (Monitoring Well)
- = PFOS/PFOA > 10 ng/L (Extraction Well/Treatment System)



Individual PFOS and PFOA Concentrations

Compared to the proposed 10 ng/L standard



Impacts From New Standards

- The drinking water standards, when adopted, will have a significant impact on future actions and requirements:
 - Ensure that drinking water is in compliance with the standards
 - BNL is reactivating carbon treatment systems on several supply wells that are impacted by PFAS
 - Pumping from several PFAS impacted supply wells are now limited or discontinued
 - If used as groundwater cleanup standards
 - Extensive additional characterization will be required
 - New remediation systems will be required (e.g., current and former firehouse plumes)
 - Remediate or establish engineered controls for source area soils
 - Potential modifications of existing groundwater treatment systems

Potable Water Supply Wells – PFAS Treatment

- BNL is planning to reactivate carbon filters that were previously installed at potable supply wells 10, 11 and 12
 - The carbon filters were originally installed in the 1980s in response to volatile organic compound contamination
 - Filters were disconnected in 2008
- Planed actions:
 1. Reactivate the carbon filters at Well 11
 - Project plan was approved by Suffolk County
 - Goal is to return filters to service by Summer 2019
 2. Reactivate the carbon filters at Well 10
 3. Prepare plans to rebuild Well 12 and reactivate the carbon filters

Testing of Private Wells

Message on Private Well Testing To Be Determined in Consultation with Suffolk County

- * NYSDEC is planning to install temporary groundwater monitoring wells near several other potential sources of PFAS in areas south of BNL

Final messages

- PFAS contamination is a national/international problem
- On a regional basis the extent of PFAS contamination is not well understood
- Once drinking water standards have been finalized, BNL's response will require:
 - Close coordination with the regulatory agencies
 - Integrate any remedial responses with the CERCLA process